Claims

[1] Polymer blended mixture comprising
50~99 wt% of an amorphous (or low crystalline) thermoplastic resin selected from the group consisting of polyethylenepropylendienterpolymer, poly(1-(trimethylsilyl)-1-propyne), amorphous nylon, polystyrene and polycarbonate;
0.9~50 wt% of a semi-crystalline polymer selected from the group consisting of polyamide(nylons), polyethylene terephtalate, polybuthylene terephtalate, polyethylene, polypropylene, polyetheretherketone, polyvinylidene flouride, polytetraflouroethylene, polyphenylene sufide and thermotropic or lyotropic liquid crystal polymer; and
0.1~10 wt% of a compatibilizer consisting of block copolymer or graft copolymer having compatibility or gererated by interfacial reaction.

[2] Polymer blended mixute according to the claim 1, wherein the compatibilizer is selected from the group consisting of poly(styrene-co-maleic anhydride), random or block copolymer of styrene and maleic, polystyrene whose oxazoline group is substituted, amorphous polymer added with maleic anhydride group, and polycarbonate and polystyrene having reaction group.

[3] Polymer blended mixture according to the claim 1 or 2, the amount of the amorphous thermoplastic resin is 75-95wt%, the amount of the semi-crystalline polymer is 4.9-25wt% and the amount of the compatibilizer is 0.1-5wt%.

[4] Polymer blended mixture according to the claim 1 or 2, wherein the semi-crystalline polymer has low gas permeability irrespective of degree of crystallinity and is selected from the group consistng of polyamide(nylons), polyethylene terephtalate, polyethylene, polypropylene, polyetheretherketone, polyvinylidene flouride, polytetraflouroethylene, polyphenylene sulfide and thermotropic or lyotropic liquid crystal polymer.

[5] Polymer blended mixture according to the claim 1 or 2, wherein the compatibilizer is positioned at the interface between the thermoplastic resin and the semi-crystalline polymer, to lower an interfacial tension between the semi-crystalline polymer and the thermoplastic resin, improves the dispersion and strengthens the interfacial adhesion as well as interacts differently for different diffusing gas molecules, hence, changes the diffusion rate of each gas.

[6] A method for preparing a film from the polymer blended mixture claimed in claim 1 or 2 comprising the step of
forming a melt blend by mixing the theremoplastic resin, the semi-crystalline polymer and the compatibilizer and

axially drawing the melt blend obtained from step a) using an extension apparatus or film blowing apparatus connected to an extrusion die to fabricate a film

wherein a phase of the semi-crystalline polymer has a stripe shape in the film due to non-equal biaxial drawing, which means more extension in the vertical direction than in the horizontal direction.

[7] A film prepared by the method claimed in claim 6.

[8] A method according to claim 6, wherein dual mandrel of which inside and outside are rotated in the opposite direction is used as the extrusion die, so that a morphologically modified semi-crystalline phase is formed in a net shape.

[9] A film prepared by the method claimed in claim 8.

[10] A method according to claim 6, wherein multilayer film composed of many layer is fabricated by using a multiple coextrusion die.

[11] A film prepared by the method claimed in claim 10.

[12] A semi-crystalline polymer blended gas seperation membrane wherein the the compatibilizer positioned at the interface of the impermeable dispersed phase of the film claimed in claims 7, 9 or 11 has the different interaction with the different gases each other by which the permeability of the film is affected and thus the film has high seperation performance.

[13] A gas separation method using the separation membrane of the claim 12.

[14] Polymer blended mixture according to claim 1 or 2, amorphous crystalline polymer of the matrix resin has a high melting point than that of semi-crystalline polymer at the processing temperature.

[15] An oriented film prepared from the polymer blended mixture of the claim 14.

[16] Gas separation process using the film of the claim 15 as a seperation membrane.

[17] Polymer blended mixture according to claim 1 or 2, semi-crystalline polymer consists of one ingredient or one or more ingredients.

[18] One layer or multilayer thin film which is prepared from the polymer blended mixture of the claim 17.

[19] A method preparing the film of the claim 18 comprising the step of

forming a melt blend by mixing the theremoplastic resin, the semi-crystalline polymer and the compatibilizer and

axially drawing the melt blend obtained from step a) using an extension apparatus or film blowing apparatus connected to an extrusion die to fabricate a film

wherein a phase of the semi-crystalline polymer has a stripe shape in the film due to non-equal biaxial drawing, which means more extension in the vertical direction than in the horizontal direction.

[20] A method according to the claim 19, wherein dual mandrel of which inside and outside are rotated in the opposite direction is used as the extrusion die, so that a morphologically modified semi-crystalline phase is formed in a net shape.

[21] Polymer blended mixture according to the claim 17, amorphous crystalline polymer of the matrix resin has a high melting point than that of semi-crystalline polymer at the processing temperature.

[22] An oriented film prepared by the method of claim 17.

[23] A semi-crystalline polymer blended gas seperation membrane wherein the the compatibilizer positioned at the interface of the dispersed phase of the film claimed in claim 22 has the different interaction with the different gases each other by which the permeability of the film is affected and thus the film has high seperation performance.

[24] Gas seperation process using the film of the claim 23 as a seperation membrane.

[25] A polymer composite film for gas seperation wherein the semi-crystalline polymer of claim 1 or 2 has a thicness of nanometer.

[26] A film according to claim 7 or 15, wherein the dispersed phase is composed of inorganic materials (such as clay) and the film includes a compatibilizer for the matrix and the dispersed phase.

[27] Gas separation process using the film of the claim 26.

[28] Polymer blended mixture according to claims 1, 2 or 3, wherein the compatibilizer is positioned at the interface by reactiong with the matrix resin or the dispersed phase to form a copolymer.

[29] A semi-crystalline polymer blended gas seperation membrane according to the claim 12, wherein the compatibilizer is positioned at the interface by reactiong with the matrix resin or the dispersed phase to form a copolymer.

[30] A film according to claim 21 or 26, wherein in case the matrix resin is PPO(poly(2,6-dimethyl-1,4-phenylene oxide) and the dispersed phase is polyamides, a random copolymer or a block copolymer of styrene and maleic anhydride is used.